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**Lee et al.**

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(54) **POWDERED POUCH AND METHOD OF MAKING SAME**

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See application file for complete search history.

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(56) **References Cited**

#### U.S. PATENT DOCUMENTS

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(\*) Notice: Subject to any disclaimer, the term of this  
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This patent is subject to a terminal dis-  
claimer.

3,186,869	A	6/1965	Friedman
3,728,739	A	4/1973	Semp
3,762,454	A	10/1973	Wilkins, Jr.
4,062,647	A	12/1977	Storm et al.
4,291,071	A	9/1981	Harris et al.
4,375,416	A	3/1983	Crisp et al.
4,435,307	A	3/1984	Barbesgaard et al.
4,534,981	A	8/1985	Zabotto et al.
4,664,064	A	5/1987	Lowe
4,760,025	A	7/1988	Estell et al.
4,810,414	A	3/1989	Huge-Jensen et al.
5,002,789	A	3/1991	Graf et al.
5,112,688	A	5/1992	Michael
5,145,842	A	9/1992	Driedger et al.
5,155,033	A	10/1992	Estell et al.

(Continued)

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#### FOREIGN PATENT DOCUMENTS

EP	0218272	A1	4/1987
EP	0260105	A2	3/1988

(Continued)

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(58) **Field of Classification Search**

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#### OTHER PUBLICATIONS

“BonuWax™ Anti-Sticking Agent,” Bioground GmbH, Germany  
(2013).

Dartois et al., Cloning, nucleotide sequence and expression in  
*Escherichia coli* of a lipase gene from *Bacillus subtilis* 168,  
*Biochim. Biophys. Acta*, 1131(3):253-60 (1992).  
International Preliminary Report on Patentability and Written Opin-  
ion for Application No. PCT/US2013/034986, dated Oct. 21, 2014.  
International Search Report and Written Opinion for Application  
No. PCT/US2013/034986, dated Jul. 9, 2013.

(Continued)

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(57)

#### ABSTRACT

Disclosed herein are water-soluble films and resulting pack-  
ets including a water-soluble film coated by a powder,  
wherein the powder includes a mixture of a powdered  
lubricant and an active agent. Optionally, the active agent  
may be encapsulated, e.g. microencapsulated, for release of  
the active agent through mechanisms including, but not  
limited to, mechanical rupture, melt, ablation, dissolution,  
diffusion, biodegradation, or pH-controlled release. Active  
ingredients described include enzymes, oils, flavors, colo-  
rants, odor absorbers, fragrances, pesticides, fertilizers, acti-  
vators, acid catalysts, metal catalysts, ion scavengers,  
bleaches, bleach components, fabric softeners and combi-  
nations thereof. Examples of packet fills include laundry  
detergents, bleach and laundry additives, fabric care, dish-  
washing, hard surface cleaning, beauty care, skin care, other  
personal care, and foodstuffs.

**58 Claims, 1 Drawing Sheet**